To improve the stream ecosystem along this reach on the North Fork Mills River, the Pisgah National Forest proposes

NFsNC Watershed Condition Framework

DRAFT - Best available data as of February 2013. Map may have been developed from different sources, accuracies and modeling, and is subject to change without notice.

Watershed Condition Framework Background

"Clean, healthy forests are vital to our efforts to protect America's fresh water supply."

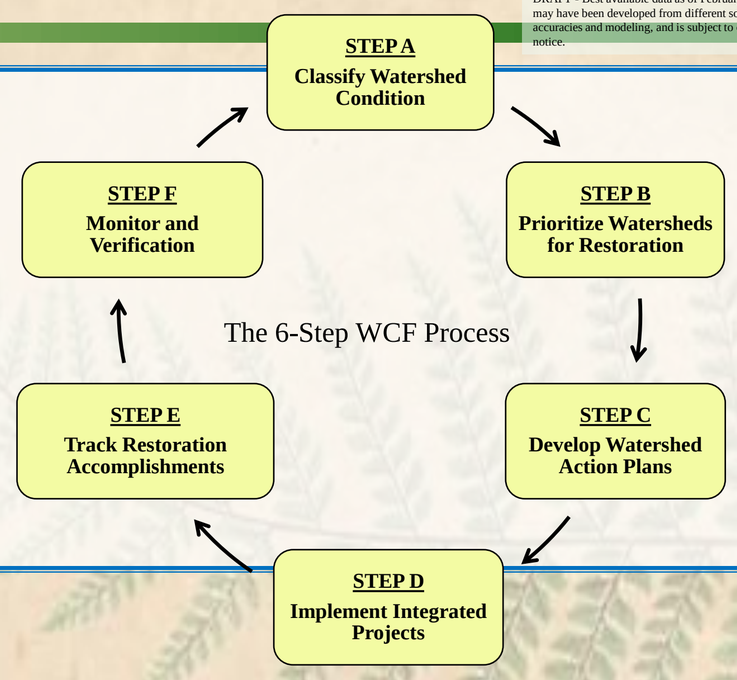
"Our nation's economic health, and the health of our citizens, depends on abundant, clean and reliable sources of freshwater."

"The Watershed Condition Framework and map will help provide economic and environmental benefits to residents of rural communities."

-Secretary Vilsack, June 3, 2011, WCC Map Rollout

With the Watershed Condition Framework (WCF), for the **first time**, the Forest Service has a process for a nationally **consistent**, **comparable**, and **credible** approach

- to evaluating watershed condition
- to prioritizing watershed improvement projects
- to measuring what has been accomplished
- to increasing Forest Service accountability in watershed restoration.



Watershed Condition Rating

The Nantahala and Pisgah National Forests completed Step A of the WCF process in 2010, ranking the condition of 6-level watersheds containing National Forest managed lands. *Figure 1* illustrates the outcome of the WCF analysis of condition classes for the Nantahala and Pisgah National Forests and the adjoining forests where watersheds are shared. Note the abundance of watersheds with "Functioning at Risk" classifications (88.9%), and only a few "Properly Functioning" (10.4%) and one "Impaired Function" watershed (0.7%).

In general across the analysis area, physical attributes exist that put the watershed at risk of functioning at a potential natural condition, and thus may not be able to maintain biological integrity. ***Trends are likely improving in most watersheds, but the risk is high that a catalyst of change, such as a large storm event, could result in impaired conditions.*** The one impaired watershed is the Reed Creek-Chattooga River watershed; shared by the Nantahala N.F., Chattahoochee N.F., and Francis Marion – Sumter N.F.

Table 1 displays the Attributes found to have the greatest adverse impact on watershed condition ranking in the WCF are associated with:

- water quality problems
- large woody debris
- native species
- roads and trails
- soil contamination
- fire condition class

Table 1. Summary of Watershed Condition Ranking by Attribute. Those attributes in Red have a relatively high percentage (>50%) of Impaired Function.

Parameter	Indicators	Attributes	Functioning Properly	Functioning at Risk	Impaired Function	% Functioning Properly	% Functioning at Risk	% Impaired Function
Watershed Totals[1] (n=135)			14	120	1	10.4	88.9	0.7
Aquatic Physical			**75**	**59**	**1**	**55.6**	**43.7**	**0.7**
	Water Quality		85	48	2	63.0	35.6	1.5
		Impaired Waters	129	3	3	95.6	2.2	2.2
		Water Quality Problems	78	10	47	57.8	7.4	34.8
	Water Quantity		116	15	4	85.9	11.1	3.0
	Aquatic Habitat		10	118	7	7.4	87.4	5.2
		Habitat Fragmentation	56	72	7	41.5	53.3	5.2
		Large Woody Debris	0	14	120	0.0	10.4	89.6
		Channel Morphology	11	123	1	8.1	91.1	0.7
Aquatic Biological			**57**	**77**	**1**	**42.2**	**57.0**	**0.7**
	Aquatic Biota		6	121	8	4.4	89.6	5.9
		Life Form	71	58	6	52.6	43.0	4.4
		Native Species	6	7	122	4.4	5.2	90.4
		Exotic /Invasive	6	125	4	4.4	92.6	3.0
	Riparian & Wetland Vegetaion		9	114	12	6.7	84.4	8.9
Terrestrial Physical			5	60	70	3.7	44.4	51.9
	Roads & Trails		**7**	**18**	**110**	**5.2**	**13.3**	**81.5**
		Open Road Density	18	25	92	13.3	18.5	68.1
		Road Maintenance	7	6	122	5.2	4.4	90.4
		Proximity to Water	26	5	104	19.3	3.7	77.0
		Mass Wasting	14	9	109	10.6	6.8	82.6
	Soil		**8**	**126**	**1**	**5.9**	**93.3**	**0.7**
		Soil Product	120	15	0	88.9	11.1	0.0
		Soil Erosion	128	5	2	94.8	3.7	1.5
		Soil Contamination	0	10	125	0.0	7.4	92.6
Terrestrial Biological			**45**	**89**	**1**	**33.3**	**65.9**	**0.7**
	Fire Regime OR Wildfire	Fire Condition Class	0	8	127	0.0	5.9	94.1
	Forest Cover	Loss of Forest Cover	128	7	0	94.8	5.2	0.0
	Terrestrial Invasives	Extent & Rate Spread	66	69	0	48.9	51.1	0.0
	Forest Health		88	46	1	65.2	34.1	0.7
		Insects Disease	84	50	1	62.2	37.0	0.7
		Ozone	12	122	1	8.9	90.4	0.7

[1] *Data includes all Shared Watersheds*

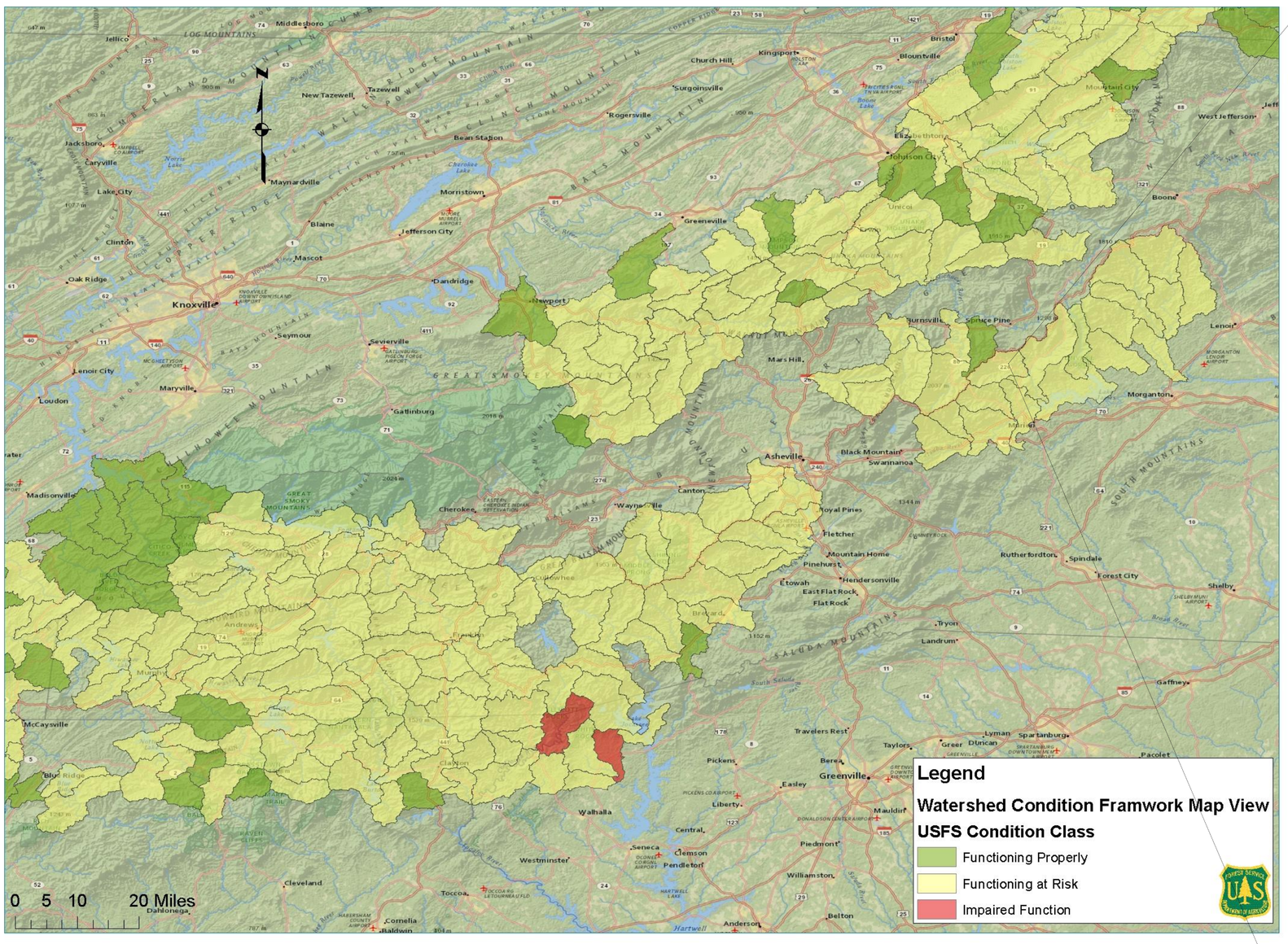


Figure 1. WCF analysis output map for the Pisgah and Nantahala National Forests and surrounding Forests.

Watershed Restoration Planning

In the near future the NFsNC will select additional Priority Watersheds where the collaborative development of Watershed Restoration Action Plans shall guide restoration.

Example of Watershed Restoration Activities – Proposed in the Armstrong Creek Watershed Action Plan

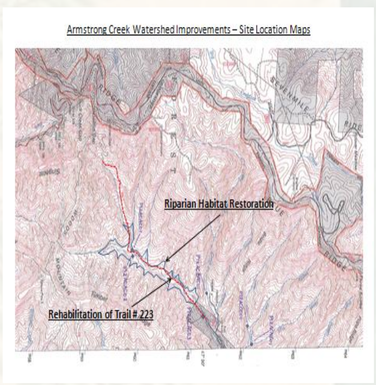
The Armstrong Creek Watershed, located on the Grandfather Ranger District, Pisgah National Forest of McDowell County, North Carolina, was selected in 2011 as the first Priority Watershed. And a Watershed Restoration Action Plan (Step C of the process) was conducted.

The Armstrong Creek Watershed ranked in a condition class of "Fair" or "Functioning at Risk". Several indicators ranked "Poor" or "Not Properly Functioning" including; Aquatic Habitat – Large Woody Debris (LWD), Aquatic Biota – Native Species, Roads and Trails- Open Road Density, - Road Maintenance, - Proximity to Water, and - Mass Wasting, Soil Contamination, and Fire Condition Class.

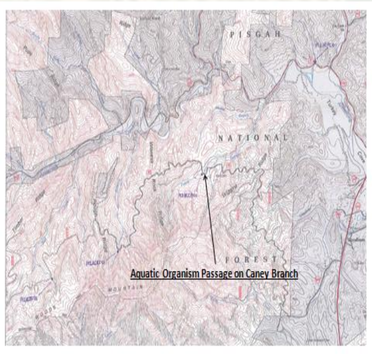
Important Ecological Values include State designated High Quality Waters, aquatic habitat for native species, terrestrial wildlife species, and Hudsonia montana on southern ridge tops.

Examples of proposed projects from the Action Plan

Riparian Habitat Restoration
Project Description: This proposal would treat stream side vegetation along stream reaches in need of large woody debris where high canopy loss resulted from eastern hemlock mortality. Restoration will be concentrated in areas with hemlock mortality and dense rhododendron. The proposed treatment includes: (1) Directional felling (pushing snags using a track-hoe) of hemlock snags into the Armstrong Creek stream channel; (2) Mechanical and chemical treatment of rhododendron to reduce its density; and (3) Planting of riparian hardwood species to improve riparian vegetation diversity. The track-hoe would use existing trails to access the sites and travel off the trail to access individual trees. No new road or trail would be constructed to accomplish this work.



Rehabilitation of Trail # 223
Project Description: Change the FS Trail #223 designation from "Horse and Bike" to "Foot Traffic Only", and relocate sections of the same trail away from the stream and improve drainage on the entire ~2 miles of trail. Relocate approximately 0.2 miles of trail out of the stream channel and stream-side area. Abandoned trail segments would be decommissioned and rehabilitated.



Aquatic Organism Passage on Caney Branch
Project Description: Replace the existing FSR 469 culvert on Caney Creek with a structure that would allow passage of aquatic native species, such as Greenhead shiner.